

# MANAGING ORGANIC WHEAT IN KENTUCKY

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## **Introduction:**

While Kentucky has very little acreage devoted to the production of organic grain crops, Iowa has over 100,000 acres in this profitable production system. With support from the Kentucky Small Grain Promotion Board and the USDA-CSREES New Crop Opportunities Center, we have now completed three years of a preliminary study on three different organic grain cropping systems on University land near Lexington, Kentucky. This report focuses on our “grain-intensive” system, which includes corn, winter wheat, and double crop soybean, the typical two-year rotation utilized on a fair percentage of Kentucky’s grain farms. *Our objective for this particular portion of our overall organic grains project was to determine appropriate combinations of planting rates and N management strategies to maximize yield and minimize disease pressure on organic wheat.*

## **Methods:**

We planted Pioneer 25R37 wheat at 25, 35, or 45 viable seeds/ft<sup>2</sup>, and matched rates of early spring (green-up stage) nitrogen to those three planting rates at 0, 20 or 40 pounds N/A. “Low” management had 25 seeds/ft<sup>2</sup> and 0 pounds N/A at green-up, “Mid” management had 35 seeds/ft<sup>2</sup> and 20 pounds of N/A, and “High” management had 45 seeds/ft<sup>2</sup> and 40 pounds of N/A. At

Feekes stage 5-6 (late tillering to early jointing), we applied late N to each management system at rates of 0, 20, 40, or 60 pounds/A. No herbicides, insecticides, or fungicides were utilized. Nitrogen fertilizer was from an approved organic source, and wheat seed was not treated.

## **Results:**

Yields were much higher in 2006 than in either 2005 or 2007 (Table 1). Management system also had a highly significant influence on yields, with the “High” management intensity resulting in the highest yields in all three seasons. Chlorophyll meter readings taken at the time of flowering and near physiological maturity indicated more leaf greenness with the higher late N rates; however, this did not result in significant yield differences.

## **Discussion:**

Over a three year period, organic wheat yields at Lexington averaged 83.2 bushels/A, similar to yields achieved by conventionally grown wheat in the Lexington area. Increased seeding rates and higher levels of early spring N consistently increased yields of organic wheat. Late spring N application rates influenced leaf greenness, but did not influence yield; however, we are reluctant to conclude that late spring N is unnecessary for organic wheat.

Note that disease pressure was moderate in 2005 (primarily leaf rust), and was very light in both 2006 and 2007. Low yields in 2007 appear to have been related to moderate spring freeze damage. Thus, this system remains untested in a severe disease season.

<b>Table 1. Yield of organic wheat at Lexington in 2005-07 as influenced by management system</b>				
<b>Management System (see details above in Methods)</b>				
<b>Year</b>	<b>Low</b>	<b>Mid</b>	<b>High</b>	<b>Year Ave.</b>
	----- bushels/A -----			
2005	66.2	74.6	74.9	71.9
2006	107.9	114.6	120.1	114.2
2007	58.8	62.0	70.1	63.6
3-year ave.	77.6	83.8	88.4	83.2